Letter from JOHN MACGILLIVRAY, ESQ., Naturalist of H. M. Surveying-ship Herald, *commanded by* Captain Denham; *dated* Sydney, March 3rd, 1854.

[We have already (vol. v. p. 279) reported progress of this voyage, destined to make a scientific survey of certain islands in the South Pacific, in a letter from Mr. Macgillivray, dated Sydney, February 23, 1853. We have now the great satisfaction of publishing extracts from a highly interesting letter from the same gentleman, detailing the particulars of the first cruise among the islands.]

We sailed from Sydney on September 2, 1853; the Torch had been left behind, and most of her officers and men transferred to the Herald. Three days afterwards we anchored at Lord Howe Island, where we remained ten days. This little island, which is distant from the nearest part of Australia about 300 miles, is only six miles in length and a mile and a half in greatest width. At one end are two mountains, respectively 2498 and 2834 feet in height. The greater part of the island is thickly wooded. There are three families and two or three other persons living on the island, but they will shortly be obliged to quit, as it is intended to form there a penal settlement for the convicts of New South Wales and Victoria. I had a tent on shore during the whole of our stay. Our surgeon (Mr. Reyner, who is and has long been a zealous collector for Haslar Museum) volunteered to join my party, and of course Milne was one of us. His collection of the plants of the island is probably tolerably complete; mine of course is very imperfect, as zoology necessarily took up most of my time. There are only (excluding a few Mosses and Lichens) thirty-six species in my fasciculus, out of which twelve are Ferns. I should think the vegetation assimilates to that of Norfolk Island; there is however no representative of the *Coniferæ*, and several of the plants appeared to me to be Australian, as *Tecoma Australis*, *Platycerium alcicorne*, etc. But I should feel more at home were I telling you of my three new species of *Diplommatina* (a remarkable genus of land-shells), and a new *Eurycanthus*, the "land-lobster" of the settlers, for on looking over my journal I see very few *botanical* notices.

A dense forest of Palms occupies nearly the whole space between the two sides of the island at this part. Whether this is an *Areca* or a *Seaforthia*, I cannot at present determine, for want of *any* book containing the generic characters, but it strongly reminds me of what several years ago I made out by Brown's 'Prodromus,' etc., to be *Seaforthia elegans*. Here and there is an occasional enormous Banyan-tree, with its singular root-like supporting stems, and some plants of a *Pandanus* (*Freycinetia*, I think, but here again the want of botanical works steps in), or "tent-tree," as it is here called. My old friend, *Flagellaria Indica*, as usual, is not tied down to the quiet orderly growth of its fellows in the vegetable kingdom, but aspires to paying rambling visits to the summits of the neighbouring trees. What with this, and the Palms, and the Banyans, and the Screw-pines, and the clumps of parasitical *Orchideæ* and Ferns, the forest scenery struck me as having quite a tropical aspect; and when, after passing some cleared land in a neglected state, overrun with weeds (among which were the ubiquitous *Stellaria media* and *Sonchus oleraceus*), and some patches of rude cultivation, we came in sight of the establishment of one of the settlers, the palm-slab built and palm-leaf thatched cottage and outhouses reminded me of a Malayan or Javanese hamlet. . . . Several species of Ferns occurred here. Besides a *Cyathea*, with a caudex ten or twelve feet in length and six inches in diameter, a very handsome *Hypolepis*, a *Pteris*, a *Litobrochia*, and a widely-spreading *Asplenium*, with fronds six feet in length, were plentiful. A long straggling *Polypodium*, and a *Pleopeltis*, ran over rocks and up the trunks of trees. We saw enormous clumps of a *Platycerium*, high up on the Banyans, and got fine specimens from a tree which had been blown down. Along with the Ferns were some fine Lichens, and a beautiful Moss (*Weissia*), which had not occurred previously.

My little encampment was broken up sooner than I anticipated, and we had to rejoin the ship, to our intense mortification, at a period when the carrying out of my plans for the remainder of the time originally allotted would have ensured a thorough investigation of the productions of this interesting island. A quantity of seeds of "vegetables" were distributed among the few settlers; and on our subsequent visit (three months afterwards), I was pleased to find, on the site where the tent had been pitched, a crop of very fine turnips, the produce doubtless of some seed which Milne had accidentally scattered there.

On September 24 we anchored at the Isle of Pines, where we remained a month. This island is situated off the S.E. end of New Caledonia, and is peopled by a similar race of men—the frizzled-hair

Papuans. I shall not however trouble you with any account of my personal adventures, or the customs, etc., of the people, or the zoology, but pass at once to some botanical scraps in my journal.

Being anxious to see the Sandal-wood tree growing, I was taken by an intelligent boy to the thickets on the low grounds behind the beach, where several were pointed out to me. Unfortunately all were of small size, and none had either flowers or fruit. The first which I saw was a small spreading bush, with smooth grey bark, having dark longitudinal broad streaks and dots, and small, glossy, elliptical, revolute, and slightly carinate leaves. At a subsequent period I was more fortunate in getting flowering specimens of the plant. . . . In the stores I was shown a large quantity of Sandal-wood recently procured from an island which, until very lately, was not known to produce it. The locality was confidentially communicated to me, and Mr. Underwood kindly promised to procure flowering specimens of it for me, as I think it may prove a new species. The Isle of Pines and the Aneiteum Sandal-wood trees are specifically distinct, and differ from *S. Freycinetianum* of the Sandwich Islands. . . . Near Hill's I showed Milne some small plants of the Sandal-wood tree, which he attempted, but in vain, to dig up; for they were merely suckers, the parent tree having long ago been cut down to the very roots. . . . Having found a fine Sandal-wood tree in a thick scrub, where it had fortunately escaped the observation of the natives, I procured for Milne a very good section of it, for the usual consideration of pipes and tobacco. This tree was about 25 feet in height, with a diameter below of 6 inches, of which the inner yellow scented portion, alone of any value, occupied 2½ inches. In preparing Sandal-wood for the market, the bark and outer white wood are cut away with an axe, reducing the billets to a small diameter; and those taken from about the root—considered the most valuable, because most highly scented—are very irregular in form. Thousands of tons of this valuable wood have from time to time been furnished by this little island, and the supply has now almost completely ceased.

In this bushy tract of country, the number of beautiful running and climbing plants was considerable. Among the most remarkable is a scarlet-blossomed *Disemma* (*D. coccinea*), and three or four *Ipomœæ*,—one with very large and handsome blue flowers, and another with equally large white ones. Close to a small village I saw some cleared, unfenced ground, where the Taro, Yam, Pumpkin, Gourd, and Sugarcane were cultivated. . . . The French "Missionary" establishment is pleasantly situated in an open valley at the edge of the table-land, with a stream from the upper grounds running past, and supplying a swamp lower down, where I found several marsh-plants. On the banks of the stream further up I observed several fine Ferns, especially a *Lomaria* (like *L. robusta* of Tristan da Cunha), with an arborescent caudex three or four feet high, and as thick as one's leg, and having a fine head of long fronds, arching outwards, giving the plant much the appearance of a dwarf Palm. A *Lygodium* spread its green drapery over the trees and bushes on the outskirts of the wood; a fine *Lindsæa* and an *Adiantum* grew by the stream, along which, here and there, were great clumps of a gigantic grass, with leaves a foot in width. . . . The total number of flowering plants collected by me at the Isle of Pines is 137; and from the circumstance of my last two excursions not having furnished a single additional species, it may be inferred that the small collection in question affords a fair sample of the vegetation of the island. Among Cryptogamia, *Algæ* are very remarkably deficient; of Fungi and Lichens I did not observe more than a dozen species; and of Mosses only five kinds. The *Lycopodiaceæ* are only two in number, but the Ferns are well represented by twenty-four species belonging to sixteen genera. Several of the most striking of these have already been alluded to in this journal. By far the most remarkable are two species of a genus (*Schizæa*, Ed.) which I cannot find described. The frond of one is linear and rush-like, of the other dichotomous and flabelliform. The latter bears on the apex of each division of the frond about six minute recurved spikes (collectively assuming a stellate appearance), each with two rows of exannulate capsular spore-cases, corrugated at the apex, dehiscing vertically, and containing two or more discoid sporangia. These two last Ferns, on my subsequent return to Sydney, were referred to the genus *Actinostachys**. The *Gramineæ*, of which there are several striking forms, constitute 16 per cent. of the Phænogamous vegetation; and the *Cyperaceæ*, *Compositæ*, and *Leguminosæ*, respectively 6, 7, and 5 per cent. The great bulk of the vegetation is arboreal; and in the groves and woods there is little underwood, but often *Flagellaria Indica*† and other rope-like climbers. Herbaceous plants occur chiefly on the margin of the woods, and in open places. Of the last description of country great tracts (considering the size of the island, which is only about eight miles in diameter) are covered with Fern (*Pteris* and *Mertensia*), coarse Grass and *Cyperaceæ*. Among the trees which give a character to the landscape, *Eutassa Cookii** takes the first place. This noble Pine, worthy of the illustrious name it bears, is naturally gregarious, but the largest individuals grow singly, or in small clumps. I had no means of judging accurately of the height which it sometimes attains, but estimate it as occasionally being as much as 150 feet, with a girth of 10 to 12 feet near the ground. In appearance this tree differs so much from *E. excelsa*, that I am surprised how the two could have been considered as identical by the botanists of Cook's voyage. Young trees growing in exposed places sometimes assume, for awhile, the pyramidal form of the Norfolk Island Pine, but the larger ones have all the branches short, and the whole tree tapers very gradually to the summit, where it is often capped by a mushroom-like terminal tuft of foliage. In one solitary instance I saw the summit of a very tall tree bifurcated. There is a very striking difference between the foliage of the young plant of *E. Cookii* and that of the tree. In the young stage, which resembles the similar condition of *E. excelsa*, the branchlets are sent out on the same horizontal plane, and the finely linear leaves, which do not touch each other, although verticillate, appear to be distichous. In the adult the leaves are broadly ovate, outwardly convex, and closely imbricated, the branchlets attaining a length of about 8 inches, and a diameter of between 0·2 and 0·4 inches. The largest male catkins which I have seen are 1½ inch long, and lanceolate; the smallest female cones are 2 inches long, and elliptical, while the largest in my possession is 3½ inches long, and almost globular, with mucronate and revolute tips to the scales. The younger female cones remind me of the heads of *Dipsacus fullonum*. From incisions in the bark or cones a thick viscid fluid exudes, and hardens into an amber-coloured gum, forming stalagmitic masses. This will not burn in the fire, is not soluble in spirit, and only partially so in water. The wood makes good planking, and small spars without knots may be made out of the lower part of the trunk: the upper is too full of knots to be useful where toughness is required. The French so-called "Missionaries," who have a saw-mill here, occupy a great part of their time in preparing plank of this tree for exportation. Although the profusion of seedlings on Observation Island would lead one to suppose that cones are abundantly produced, yet one of the only two Pines upon the island bearing fruit when cut down, afforded no more than three small cones, although there were male catkins in abundance. It is monœcious, as *E. excelsa* also certainly is, although I recollect having seen the latter described as diœcious. I forgot to mention in its proper place, that in the very young *E. Cookii*, the four linear cotyledonous leaves are arranged in pairs, while in *E. excelsa* they are equidistant. A *Pandanus*, like *P. pedunculata*, is common; and mats, bags, and baskets of various kinds, are made from the young leaves. The Cocoanut-tree, with its multifarious uses, is the solitary representative of the Palms; and a very fine, wide-spreading, small-leaved *Ficus* is, next to the Pine, the most striking and ornamental tree upon the island. The entrance to "King Jemmie's" palace is through one of these trees, a natural hole in the arched roots of which, having been artificially widened, now presents the appearance of a Gothic arch. Of *Orchideæ* I observed five species: one, a *Dendrobium*, is found on rocks and dead branches of trees; and two of the others are tall, handsome white- and purple-flowered plants, growing among the Fern. Of plants which have probably been introduced, in addition to those which are regularly cultivated, I may mention the Bread-fruit tree, the Papaw, Indian corn, and the Castor-oil plant; but the fruit of the first two does not seem to be held in much esteem. As *Cynthia Cardui* is among insects, from my finding it almost everywhere, in whatever part of the earth I put my foot, so among plants is *Sonchus oleraceus*, which is a weed all over the Isle of Pines, and is commonly eaten by the natives, stem and leaves, uncooked. The only other botanical fact which I shall allude to here is the occurrence of two Proteaceous shrubs* near the summit of the Peak (885 feet). One of these appears to be certainly, and the other possibly, a *Grevillea*, an important fact in botanical geography, for this genus is regarded as being ex-

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* One of them is the *Actinostachys digitata*, Wall. (*Schizæa*, Sw. et alior.).

† There is a very remarkable new genus: with foliage and general habit of some of the very broad-leaved Grasses, but with the flowers, and apparently fruit, of *Flagellaria*;—*n.* 770 of Mr. Macgillivray's collection, *n.* 172 of Mr. Milne's: not a climber.

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* *Dombeya columnaris*, Forst. Prodr.—*Araucaria Cookii*, Br. Ms., *A. columnaris*, Hook. Bot. Mag. t. 4635.

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* There are two highly interesting and new Proteaceous plants. One, the *Grevillea*, may be thus defined:—

1. Grevillea *Gillivrayi*, Hook.; frutex humilis, ramis robustis junioribus aureo-sericeis, foliis coriaceis oblongis obtusis vel retusis brevi-mucronatis oblique penninerviis reticulatim venulosis marginibus recurvis inferne in petiolum brevem attenuatis supra glabris subtus sericeis, racemis multifloris oblongis obtusis patentibus brevi-pedunculatis e ramis novellis terminalibus vix foliosis albo-sericeis, pedun-

clusively Australian. Of these two last there are fortunately living plants of Milne's; and, besides other things, some of a fine Pitcher-plant, which is *not N. distillatoria.* We found this last in one very confined locality, a small patch of swampy ground by a stream, crossing the road along which we were proceeding to Kaji, on a visit to the principal chief, or rather king, for he exercises absolute authority not only over the whole of the Isle of Pines, but also over a portion of New Caledonia. But this is not botany; so, by way of making amends, I may mention that Wendagu (the king) told me, while showing some large double canoes, that they were made in New Caledonia, out of a large tree growing there, which he had heard the sandal-wood traders call *Kaurie.* Now of course this was a Dammara, and no doubt a very noble one. I believe one from that island, got by Moore, has been described. You allude in your last letter to specimens of a Dammara, sent by the late Sir J. Everard Home to the British Museum, from the *Isle of Pines.* Now the locality is incorrect: there is no Dammara there. The species in question, if not the Aneiteum one—of which more anon—is doubtless from the Fijis, where I know he got specimens of a similar character.

We sailed from the Isle of Pines on October 22. We were off Matthew Island on November 4, but it was quite impracticable to land,

culis rachibusque crassis, stylis elongatis glabris perianthio triplo longioribus, stigmate conico-apiculato.

Grevillea. *Macgillivray, Herb. Voy. of H.M.S. Herald, n.* 854.

HAB. Near the summit of the Isle of Pines, main peak, October, 1853. *John Macgillivray, Esq., Mr. W. Milne.*

A very beautiful and well-marked species. Leaves larger, but in shape and texture and colour not much unlike those of *Olea Europæa.* Racemes copious, bearing very numerous flowers.

The other is a *Stenocarpus:*—

2. Stenocarpus *Milnei,* Hook.; frutex glaber humilis, ramis gracilibus strictis, foliis linearibus pinnatifidis subbipinnatifidisve inferioribus simplicibus, laciniis oppositis elongatis obtusis apice glanduloso-callosis ecostatis subreticulatim rugulosis marginibus parum reflexis, pedunculis axillaribus foliis brevioribus, umbellis subsexfloris, involucri foliolis parvis subulatis, pedicellis apice incrassatis calyculatis, stigmate laterali orbiculato.

HAB. Near the summit of the main peak of the Isle of Pines; abundant. *Mr. W. Milne* (*Herb. n.* 118); *Macgillivray, Herb. Voy. of H.M.S. Herald, n.* 855.

General habit of some of the slender varieties of *Grevillea linearis:* but there the leaves are all linear acute, strongly costate, and, as well as the racemose flowers, more or less silky. I refer it to *Stenocarpus,* in the absence of fruit, with little hesitation, in consequence of the truly umbellate inflorescence, and the nature of the stigma, and the general resemblance of the flowers to the original *Stenocarpus Forsteri,* Br. It is a graceful, slender-twigged shrub.

and no anchorage could be found. There did not appear to be any vegetation whatever on the island, which is merely a large cinder, having been seen smoking a few years ago; so I shall pass on to Aneiteum, which we reached on November 7, and where we remained for three weeks. It is the most southern island of the New Hebrides, and on the charts is incorrectly called Annatom or Annatam. My collection of Aneiteum plants is very small, consisting only of sixty-nine species, of which forty-one are Ferns. Although we spent three weeks at Aneiteum, I had very little time to devote to collecting of plants. This however is not of much consequence, as Milne was diligently employed during our stay. The great variety, beauty, and often singularity of the Ferns, I find frequently alluded to in my journal. The damp woods of the interior of the island, especially along the course of the mountain-streams, furnished, among others, a remarkable *Litobrochia*, with the habit of *Lygodium*, running over trees; an *Oleandra*, forming great tufts of linear fronds, five feet long; and a tall, handsome *Marattia*, and a fine flabelliform *Schizæa*, are common in the woods. On the low grounds I fell in with a clump of three individuals of a very fine *Alsophila*, the largest of which had a caudex 15 feet in height to the giving off of the first frond, and 30 inches in circumference at 6 feet from the ground, while the beautiful tripinnate fronds, arching gracefully outwards, attain the length of from 10 to 15 feet. In cutting down this, I ascertained from the natives that the central part near the top is eaten: it reminded me of a bad turnip. A handsome Melastomaceous bush is abundantly mixed up with a very showy white-flowered *Vaccinium* (*V. cereum*, Forst.), on the stiff clayey lower hills. A tall reed forms thickets everywhere on the low grounds, and from its stoutness and height (6 to 8 feet), is much used in the construction of very efficient single or double fences, also as supports for the Yam plants. Of the Breadfruit there are said to be about twenty kinds, specially distinguished by name. I could not myself make out more than two or three well-marked varieties. Four Palms occur—*Cocos*, *Caryota*, *Areca*, and *Sagus*: the last three are rare, and are generally seen near houses. But the most remarkable plant of Aneiteum is a *Dammara*, which Moore (who got it there while in the Havannah) tells me is *D. obtusa*. It does not however agree at all in leaf or cone with the description of that species which I lately saw in Paxton; and yet there is only one *Kaurie* on Aneiteum, which is abundant, and has long been used for timber, as applied to *D. obtusa* in the description. The only way in which I can account for the discrepancy is, that Moore's specimens had been wrongly labelled for locality. Sir E. Home's certainly were, when they were stated to be from the Isle of Pines. The largest Aneiteum *Dammara* which I saw, measured 23½ feet in circumference 5 feet from the ground. Unlike the *D. Australis* of New Zealand, it is not considered suited for large spars, but cuts up into excellent planks. I could not get any ripe cones; and although abundance of full-sized green ones were hung up on board, in hopes of *some* reaching Sydney in a state fit for germination, the experiment proved a failure. So was it also with *Eutassa Cookii.* The only other Aneiteum plant I shall mention here is a *Santalum*, once abundant, but now almost extinct, so much so that I saw only one individual, that which furnished me with specimens. It had probably escaped the axe of the native on account of its small size, being only a sapling as thick as the wrist, and commercially valueless. I regret not having done more for the botany of Aneiteum, but two-thirds of my entire time were taken up with the vocabularies and grammar, combined with ethnology,—the last important to be secured before Christianity will have brought about the great change in morals and customs which it has already partially accomplished, thanks to the two missionaries of Aneiteum. Even in the central pagan district of Itaho, any European with ordinary prudence and courage is now perfectly safe while passing through from one side of the island to the other, and its magnificent valleys and wooded ravines may be explored by any wandering naturalist. Two-thirds of the population of 2500 belong to the Christian party, wear clothing of some description or other, and have ceased to practise war among themselves, infanticide, and the once customary strangling of widows. The nature of my researches led me to have much intercourse with the natives, and I satisfied myself that the stories regarding the missionaries (originating from sandalwood traders and others) grossly maligned two good men devoted to the service of their Divine Master.

On November 2 we reached the neighbouring island of Futuna, or Erronan, and, there being no anchorage, stood off and on for two days, during which I was as much on shore as possible, but did not collect any plants. The vegetation of Futuna exactly corresponds to that of Aneiteum, *so far as it goes*, but without the extent and diversity of the latter island. This is in a great measure owing to the want of moisture, caused by local influences, unfavourable to the growth of the Ferns and other inhabitants of dense and moist woods, so numerous in Aneiteum. Among the more remarkable plants not before alluded to (Cocoa-nut, Bread-fruit, reed-like Grass, Yam, Taro, Horse-taro, Kava, etc.), I may mention the purple-flowered *Eugenia*, and the *Areca* of Aneiteum, a *Casuarina* frequenting the shores, a small *Pandanus*, with very long stolons, which is gregarious and abundant, and from the leaves of which baskets and mats are made; and lastly, *Guettarda speciosa*, the beautiful white blossoms of which ornamented the rugged and parched coral-rocks at the N.W. point. Futuna, I may mention, is only about seven miles in circumference, with a steep rocky shore, fringed with coral. It is well wooded, except where the declivity is too great; and the summit (2000 feet) is a dead level, three-quarters of a mile in diameter, and apparently inaccessible. Thanks to the influence of the two native teachers from Aneiteum, the Futunese are now so much less dangerous to visitors than formerly, that I landed alone and unarmed in a canoe (our own boat being unable to face the surf), and traversed the whole island, mixing freely with the people, inspecting their huts and gardens, etc., and was treated with civility throughout.

On the night of passing Tana (Tanna), the volcano made a fine display. By the bye, we had experienced a severe shock of an earthquake at Aneiteum, one day soon after our arrival. On December 7, while hove-to off the island of Mare, two boats were sent on shore, but I had not the opportunity of landing. One of the principal features of this island consists in the abundance of Pines, which were easily recognized, and afterwards identified (from cones brought off) as *Eutassa Cookii.*

On December 10 we reached the Isle of Pines, on our return to Sydney, and remained ten days there, or until the completion of the survey. Fortunately, this time I was enabled to obtain good flowering specimens of the *Santalum* formerly alluded to.

We anchored off Lord Howe Island on the 26th, after having spent a very merry Christmas on very small means. We had no roast beef, but managed to concoct a plum-pudding, and, like Mark Tapley, made ourselves "jolly under the circumstances." During the few hours spent on shore there, the most notable botanical fact was the discovery, on the site of our tent, of a clump of fine turnips, derived no doubt from some seeds which Milne had accidentally scattered there while serving them out to the settlers three months before.

On January 1st we reached Sydney, where we have been ever since. I have not, nor has any one present, the slightest idea when we sail, or where we at go.

[Among the more remarkable and interesting of the plants that have been already received from the islands thus visited, are a new genus of shrub, apparently of the Order *Dilleniaceæ* (Isle of Pines, n. 849, *Mr. Macgillivray*,—n. 141, *Mr. Milne*); and, from Aneiteum, the curious *Geissois racemosa* of Labillardière, Sertum Austro-Caledonicum, p. 50. t. 50; of which the *G. ternata* of A. Gray, in the Botany of the United States Exploring Expedition, from the Fejee Islands, is probably only a variety.]

On the North Brazilian EUPHORBIACEÆ *in the collections of* Mr. Spruce; *by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 333.)

MABEA.

Our herbaria now contain nine or perhaps ten species of this genus, of which three only are published. All yield a copious milky juice, which, however, we do not hear of being applied to any specific purpose. The bark of one of them is, according to Martius, considered in the Diamond district as a febrifuge; and the young shoots of several species, under the name of *Tacuari*, are used for tobacco-pipes in Guiana and Brazil. Partly on this account, partly from the general resemblance in habit of the species to each other, there is some confusion in the application of the names of the older ones. Aublet's may indeed now be identified from his descriptions, but Martius' *M. fistulifera* is only known by so short a diagnosis, that I cannot even now feel any certainty as to the correctness of my determination, although I am convinced I was wrong as to the species I gave that name to in my first distribution of Spruce's plants.

The several species may from their inflorescence be divided into groups as follows:—

Ser. I. RACEMOSÆ.—*Racemi* solitarii, terminales, thyrsoidei. *Bracteæ* marium glandulis 2 magnis siccitate nigris nitidis stipatæ.